

Application No. 10/716,724
Amendment and Response dated April 14, 2006
Reply to Office Action of December 14, 2005

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims **1-2** (canceled)

3. (previously presented) A method of printing on a substrate comprising the steps of:

moving a print head carriage, having at least one ink jet nozzle thereon, parallel to a plane in which is supported a substrate having a surface that may be at any of a plurality of locations relative to the plane;

sensing the position of the surface of the substrate relative to the carriage;
and

adjusting of the distance from the nozzle to the plane in response to said sensing to position the nozzle at a predetermined distance from the surface of the substrate where ink is to be jetted from the nozzle;

jetting ink from the nozzle across the predetermined distance onto the surface of a substrate.

4. (previously presented) The method of claim **3** wherein:

the sensing of the position is carried out while moving the print head carriage; and

the adjusting includes varying the position of the nozzle relative to the plane as the print head carriage moves so as to maintain the predetermined distance across the substrate in response to the sensed distance.

Claim **5-6** (canceled)

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7. (currently amended) ~~The method of claim 6 further comprising the step of:~~

A method of printing on rigid panels comprising the steps of:

moving parallel to a rigid panel a print head carriage having an ink jet nozzle thereon directed toward a surface of the panel;

automatically adjusting the distance of the nozzle from the panel to maintain a predetermined distance between the nozzle and the surface of the panel at the location onto which ink is to be jetted from the nozzle;

while moving the print head carriage, jetting ink from the nozzle across the predetermined distance and onto the surface of the rigid panel;

the surface of the panel onto which the ink is jetted varying across the panel in its distance from the carriage; and

the adjusting including varying the position of the nozzle relative to the panel as the print head is moved to maintain the predetermined spacing between the nozzle and the location on the surface at which the ink is jetted;

sensing the distance between the print head carriage and locations on the surface at which ink is to be jetted; and

varying the position of the nozzle relative to the print head carriage in response to the sensed distance.

Claims **8-17** (canceled)

18. (currently amended) ~~The system of claim 15 wherein~~ A system for printing images on a substrate, comprising:

a multiplicity of print heads mounted in a carriage, the print heads being positioned a distance from the substrate;

a sensor which detects the position of the surface of the substrate; and

a control system which receives the information detected by the sensor and transmits signals to a motor coupled to the carriage, the transmitted signals instructing the motor to adjust the position of the print heads to maintain a desired gap between the print heads and the substrate;

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the control system including a controller which transmits the signals to the motor; and

the control system ~~includes~~ including a feedback device which senses the gap between the print heads and the substrate, the gap information being relayed to the controller such that the controller can further instruct the motor to alter the position of the print heads relative to the substrate to achieve the desired gap.

19. (previously presented) The system of claim **18**, wherein the feedback device transmits the gap information to a CPU which processes the information and relays the processed gap information to the controller.

Claims **20-27** (canceled)

28. (currently amended) The system of any of claims ~~15 or 17 through 20~~ 18 or 19 wherein the sensor detects the position of the surface of the substrate as the substrate moves through the system.

Claims **29-32** (canceled)

33. (currently amended) ~~The system of claim 15, wherein:~~

A system for printing images on a substrate, comprising:

a multiplicity of print heads mounted in a carriage, the print heads being positioned a distance from the substrate;

a sensor which detects the position of the surface of the substrate; and

a control system which receives the information detected by the sensor and transmits signals to a motor coupled to the carriage, the transmitted signals instructing the motor to adjust the position of the print heads to maintain a desired gap between the print heads and the substrate;

the control system including a controller which transmits the signals to the motor;

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the print heads ~~are being~~ bidirectional print heads that print while moving transversely across a substrate that is moveable longitudinally relative to the print heads; ~~and~~

the sensor ~~includes including~~ two sensors mounted in the carriage transversely of the print heads, one on each side of the print heads.

Claim **34** (canceled)

35.(currently amended) ~~The method of claim 34, wherein~~

A method for controlling the distance between print heads of a printing system and a substrate, comprising:

moving the substrate relative to the print heads;

detecting the position of the surface of the substrate while the substrate moves relative to the print heads;

transmitting information of the position of the surface of the substrate to a controller;

transmitting height adjustment information signals from the controller to a motor coupled to a carriage which holds the print heads; and

adjusting the position of the print heads with the motor to maintain a desired gap between the print heads and the substrate;

the signals instructing the motor to adjust the position of the print heads to maintain the desired gap between the print heads and the substrate; and

the detecting of the position of the surface of the substrate ~~includes including~~ detecting the distance between the print heads and the substrate.

36. (original) The method of claim **35**, further comprising transmitting the distance information to the controller and re-adjusting the position of the print heads based on the distance information detected.

Claims **37-41** (canceled)

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42. (currently amended) The ~~method of claim 41~~ wherein:

A method for controlling the distance between print heads of a printing system and a substrate, comprising:

moving the substrate relative to the print heads;

detecting the position of the surface of the substrate while the substrate moves relative to the print heads;

transmitting information of the position of the surface of the substrate to a controller;

transmitting height adjustment information signals from the controller to a motor coupled to a carriage which holds the print heads; and

adjusting the position of the print heads with the motor to maintain a desired gap between the print heads and the substrate;

the signals instructing the motor to adjust the position of the print heads to maintain the desired gap between the print heads and the substrate;

the moving of the substrate including moving the substrate longitudinally relative to the printheads;

the method further including moving the print heads transversely on a carriage relative to the substrate;

the transmitting of the information including transmitting the information from a sensor on the carriage; and

the transmitting of the ~~thickness~~ information includes transmitting the information from at least one of at least two sensors mounted on the carriage.

Claims **43-53** (canceled)